FIG. 1

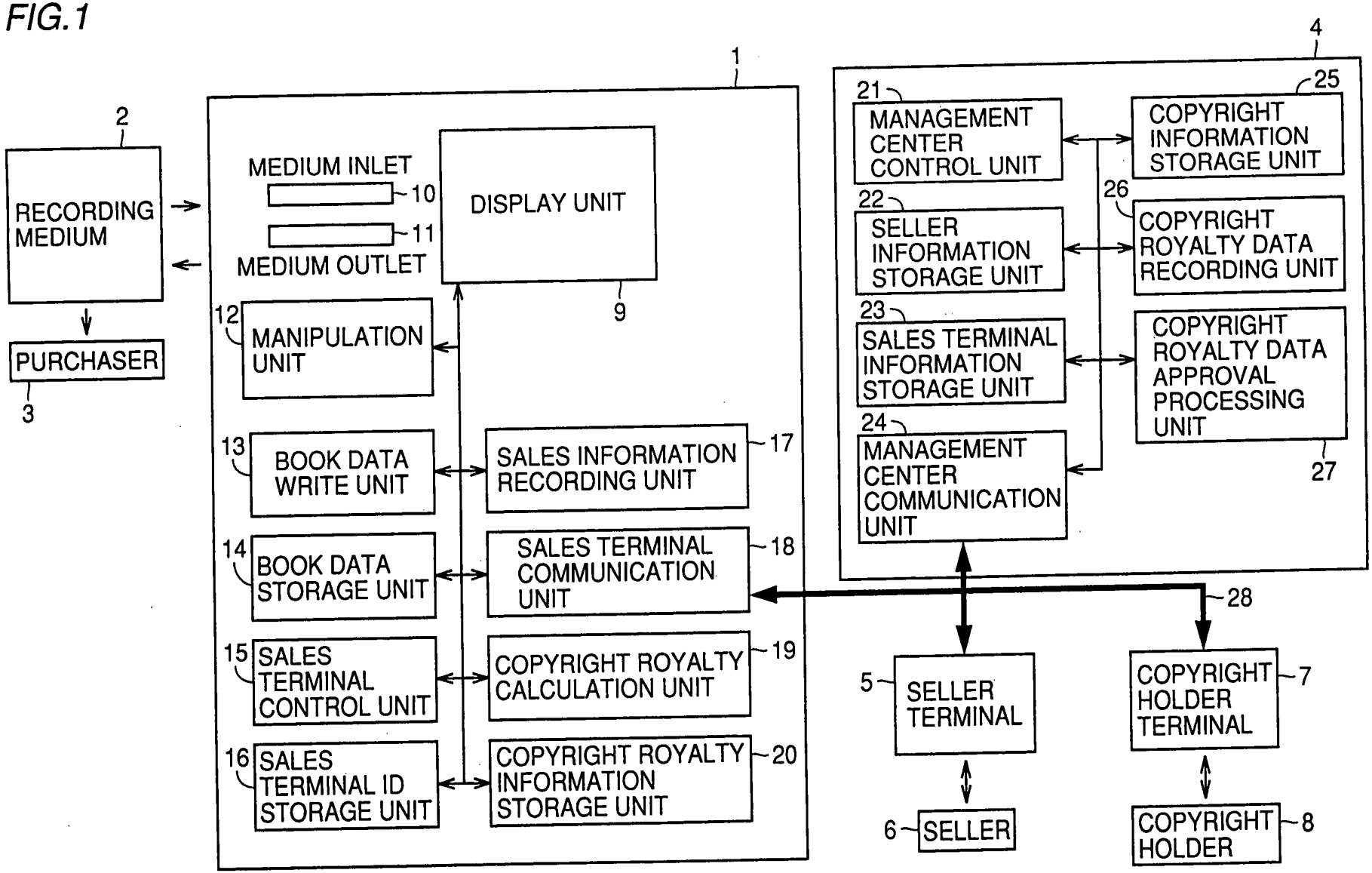

1
2
RECORDING MEDIUM
PURCHASER
3
MEDIUM INLET
10
11
MEDIUM OUTLET
DISPLAY UNIT
9
12
MANIPULATION UNIT
13
BOOK DATA WRITE UNIT
14
BOOK DATA STORAGE UNIT
15
SALES TERMINAL CONTROL UNIT
16
SALES TERMINAL ID STORAGE UNIT
SALES INFORMATION RECORDING UNIT
17
SALES TERMINAL COMMUNICATION UNIT
18
COPYRIGHT ROYALTY CALCULATION UNIT
19
COPYRIGHT ROYALTY INFORMATION STORAGE UNIT
20
4
21
MANAGEMENT CENTER CONTROL UNIT
22
SELLER INFORMATION STORAGE UNIT
23
SALES TERMINAL INFORMATION STORAGE UNIT
24
MANAGEMENT CENTER COMMUNICATION UNIT
25
COPYRIGHT INFORMATION STORAGE UNIT
26
COPYRIGHT ROYALTY DATA RECORDING UNIT
COPYRIGHT ROYALTY DATA APPROVAL PROCESSING UNIT
27
28
5
SELLER TERMINAL
6
SELLER
COPYRIGHT HOLDER TERMINAL
7
COPYRIGHT HOLDER
8

FIG.2

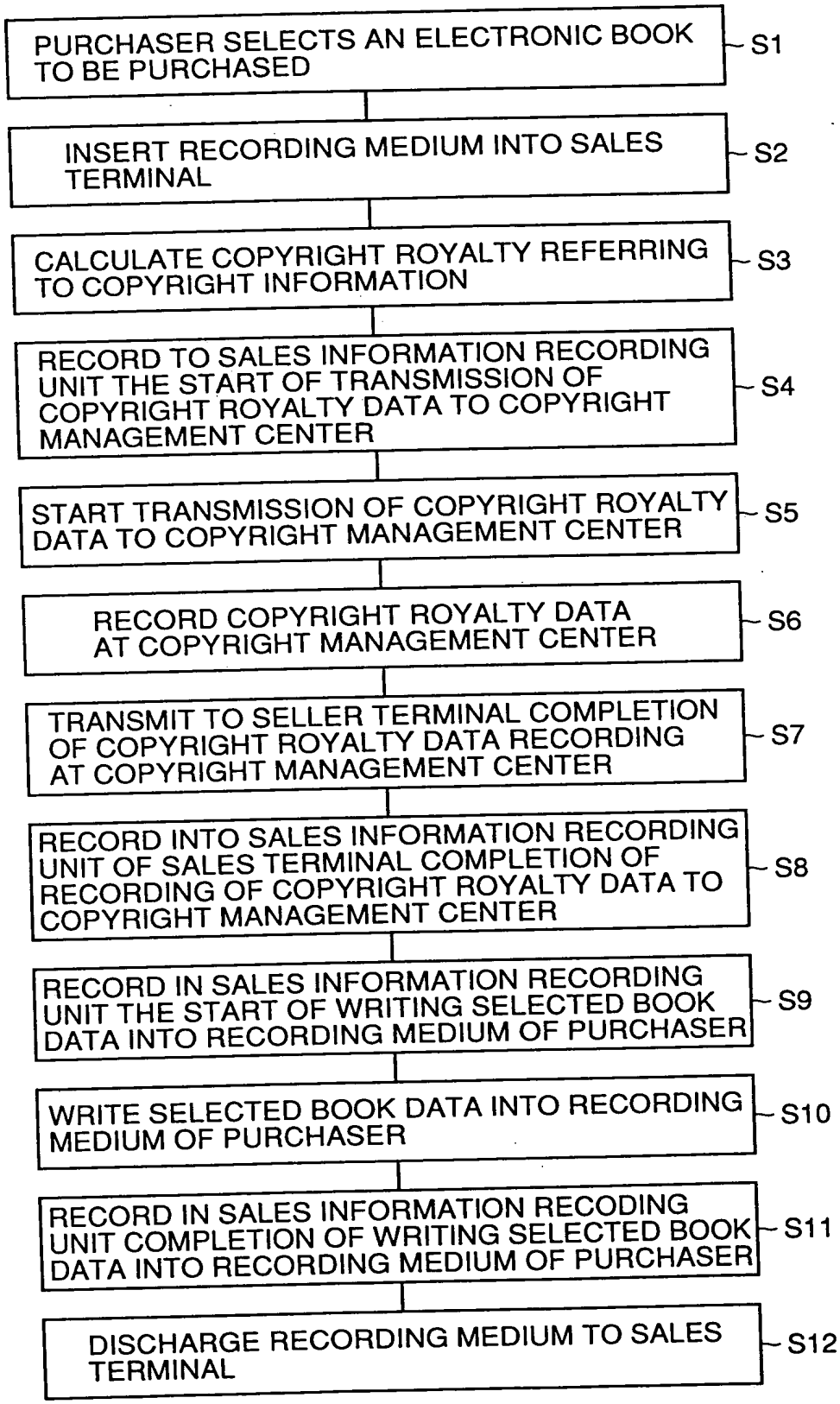

PURCHASER SELECTS AN ELECTRONIC BOOK TO BE PURCHASED
S1
INSERT RECORDING MEDIUM INTO SALES TERMINAL
S2
CALCULATE COPYRIGHT ROYALTY REFERRING TO COPYRIGHT INFORMATION
S3
RECORD TO SALES INFORMATION RECORDING UNIT THE START OF TRANSMISSION OF COPYRIGHT ROYALTY DATA TO COPYRIGHT MANAGEMENT CENTER
S4
START TRANSMISSION OF COPYRIGHT ROYALTY DATA TO COPYRIGHT MANAGEMENT CENTER
S5
RECORD COPYRIGHT ROYALTY DATA AT COPYRIGHT MANAGEMENT CENTER
S6
TRANSMIT TO SELLER TERMINAL COMPLETION OF COPYRIGHT ROYALTY DATA RECORDING AT COPYRIGHT MANAGEMENT CENTER
S7
RECORD INTO SALES INFORMATION RECORDING UNIT OF SALES TERMINAL COMPLETION OF RECORDING OF COPYRIGHT ROYALTY DATA TO COPYRIGHT MANAGEMENT CENTER
S8
RECORD IN SALES INFORMATION RECORDING UNIT THE START OF WRITING SELECTED BOOK DATA INTO RECORDING MEDIUM OF PURCHASER
S9
WRITE SELECTED BOOK DATA INTO RECORDING MEDIUM OF PURCHASER
S10
RECORD IN SALES INFORMATION RECODING UNIT COMPLETION OF WRITING SELECTED BOOK DATA INTO RECORDING MEDIUM OF PURCHASER
S11
DISCHARGE RECORDING MEDIUM TO SALES TERMINAL
S12

FIG.3A

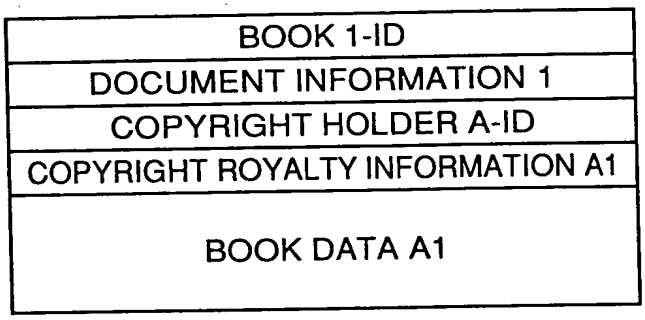


FIG.3B

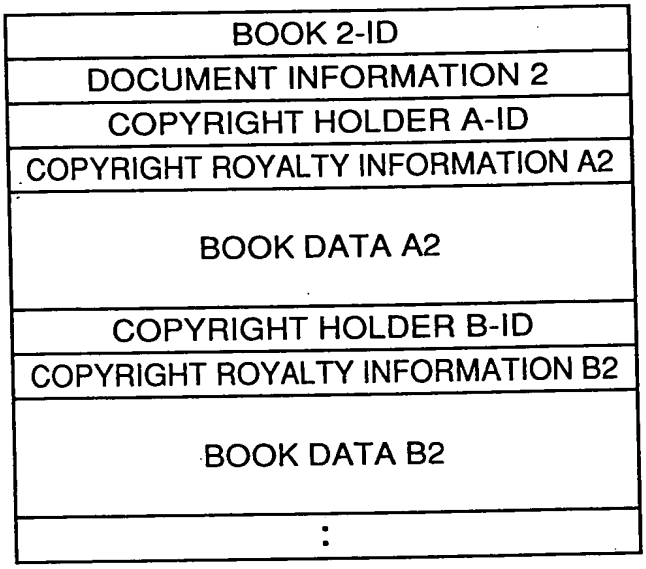


FIG.3C

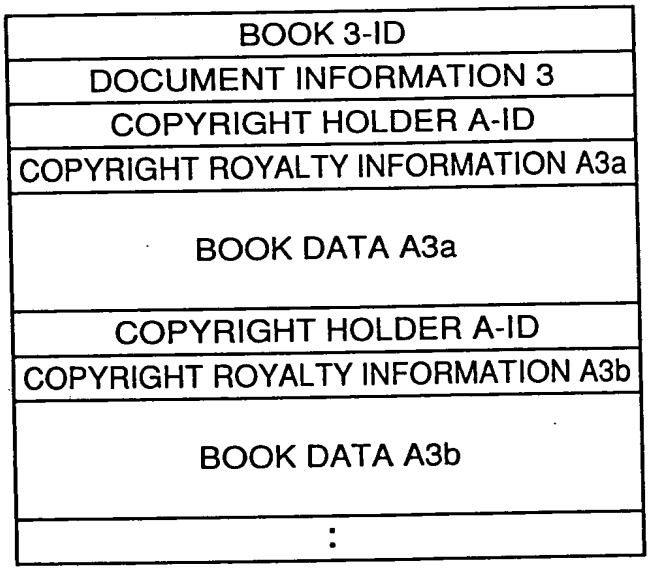


FIG.4

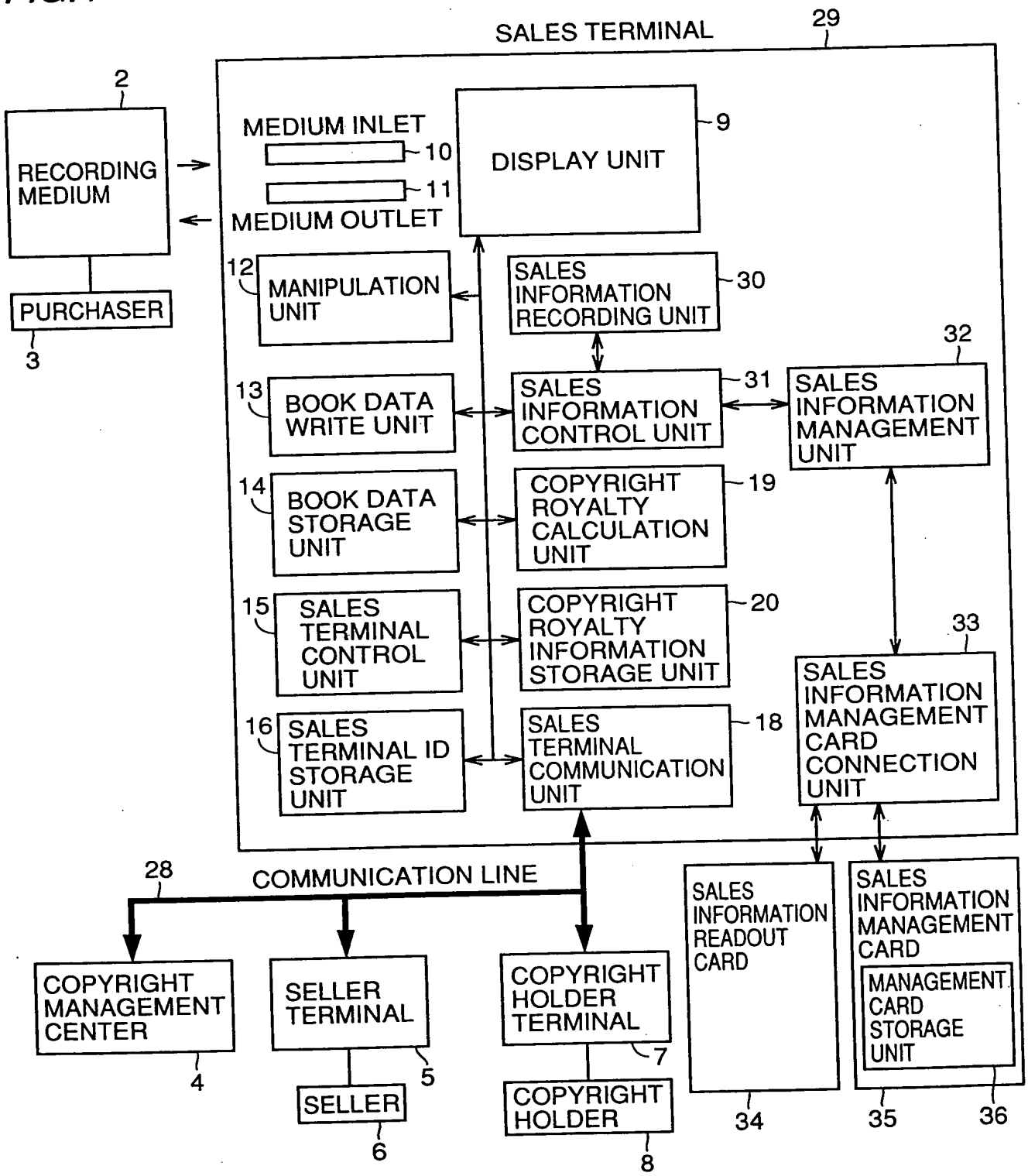

SALES TERMINAL
29
2
RECORDING MEDIUM
PURCHASER
3
MEDIUM INLET
10
11
MEDIUM OUTLET
DISPLAY UNIT
9
12
MANIPULATION UNIT
SALES INFORMATION RECORDING UNIT
30
32
13
BOOK DATA WRITE UNIT
SALES INFORMATION CONTROL UNIT
31
SALES INFORMATION MANAGEMENT UNIT
14
BOOK DATA STORAGE UNIT
COPYRIGHT ROYALTY CALCULATION UNIT
19
15
SALES TERMINAL CONTROL UNIT
COPYRIGHT ROYALTY INFORMATION STORAGE UNIT
20
33
16
SALES TERMINAL ID STORAGE UNIT
SALES TERMINAL COMMUNICATION UNIT
18
SALES INFORMATION MANAGEMENT CARD CONNECTION UNIT
28
COMMUNICATION LINE
COPYRIGHT MANAGEMENT CENTER
4
SELLER TERMINAL
5
SELLER
6
COPYRIGHT HOLDER TERMINAL
7
COPYRIGHT HOLDER
8
SALES INFORMATION READOUT CARD
34
SALES INFORMATION MANAGEMENT CARD
MANAGEMENT CARD STORAGE UNIT
35
36

FIG.5

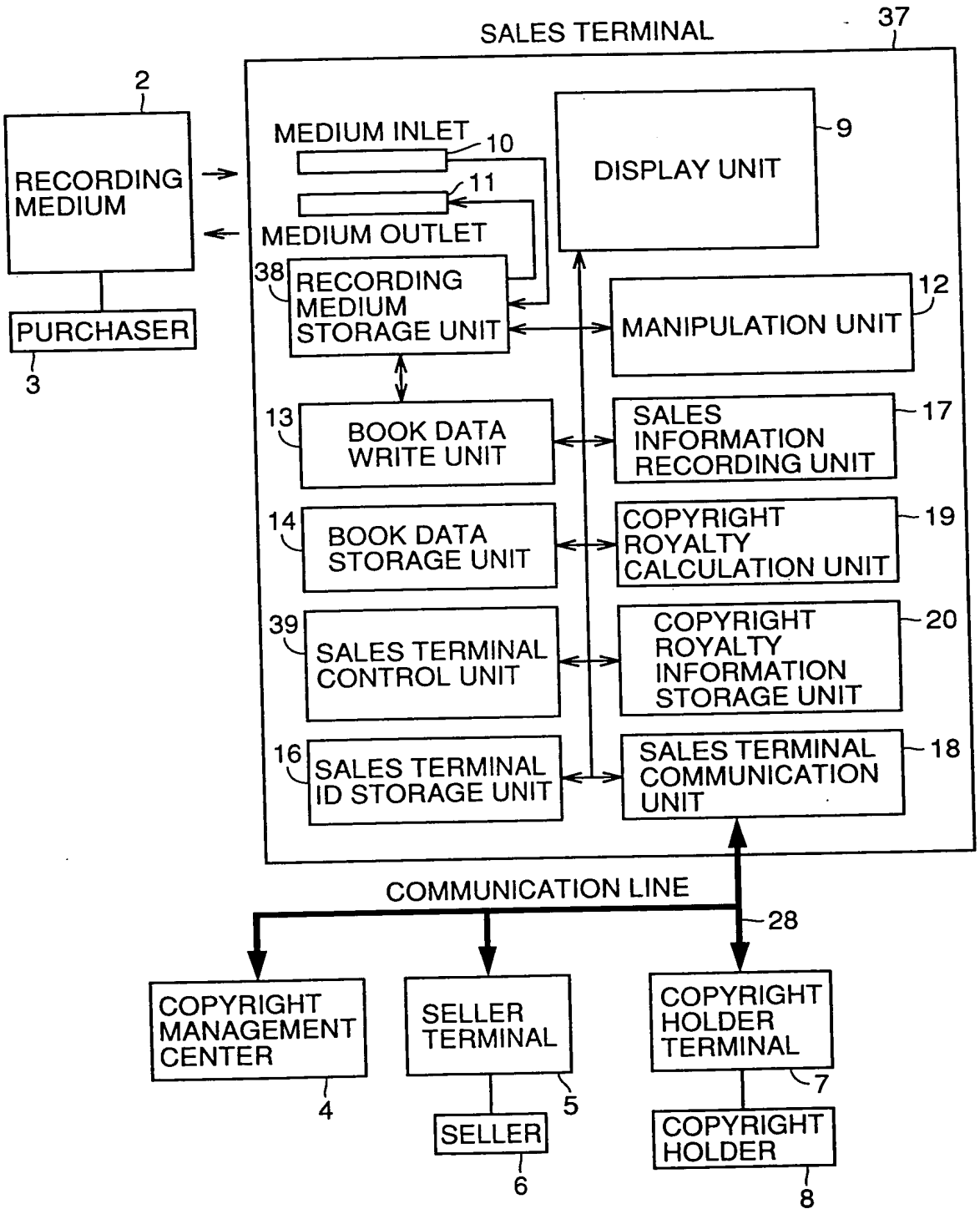

SALES TERMINAL
37
2
RECORDING MEDIUM
PURCHASER
3
MEDIUM INLET
10
11
MEDIUM OUTLET
38
RECORDING MEDIUM STORAGE UNIT
DISPLAY UNIT
9
MANIPULATION UNIT
12
13
BOOK DATA WRITE UNIT
SALES INFORMATION RECORDING UNIT
17
14
BOOK DATA STORAGE UNIT
COPYRIGHT ROYALTY CALCULATION UNIT
19
39
SALES TERMINAL CONTROL UNIT
COPYRIGHT ROYALTY INFORMATION STORAGE UNIT
20
16
SALES TERMINAL ID STORAGE UNIT
SALES TERMINAL COMMUNICATION UNIT
18
COMMUNICATION LINE
28
COPYRIGHT MANAGEMENT CENTER
4
SELLER TERMINAL
5
SELLER
6
COPYRIGHT HOLDER TERMINAL
7
COPYRIGHT HOLDER
8

FIG.6

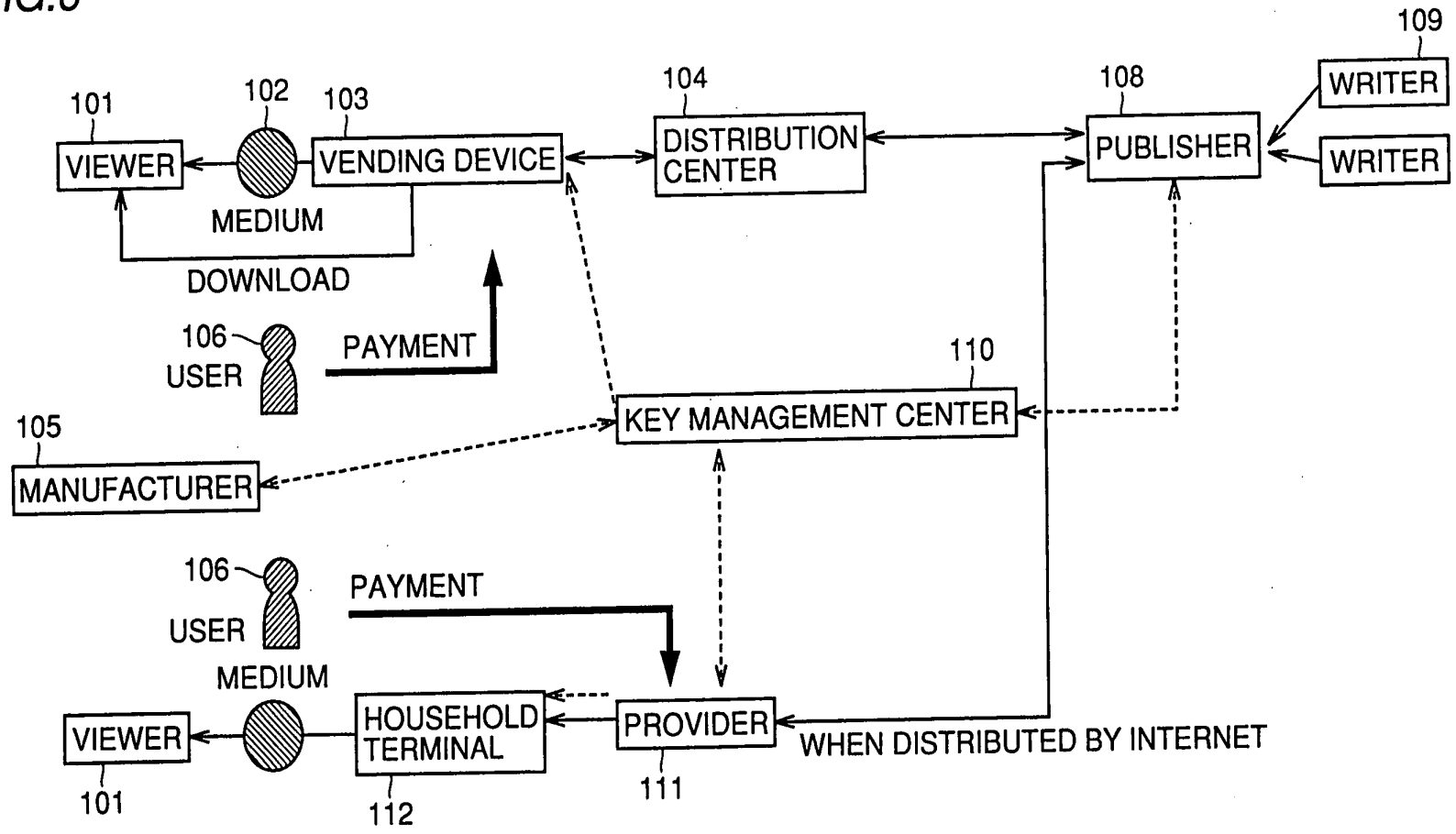

101
VIEWER
102
103
VENDING DEVICE
MEDIUM
DOWNLOAD
104
DISTRIBUTION CENTER
108
PUBLISHER
109
WRITER
WRITER
106
USER
PAYMENT
110
KEY MANAGEMENT CENTER
105
MANUFACTURER
106
USER
PAYMENT
MEDIUM
VIEWER
101
HOUSEHOLD TERMINAL
112
PROVIDER
111
WHEN DISTRIBUTED BY INTERNET

FIG.7

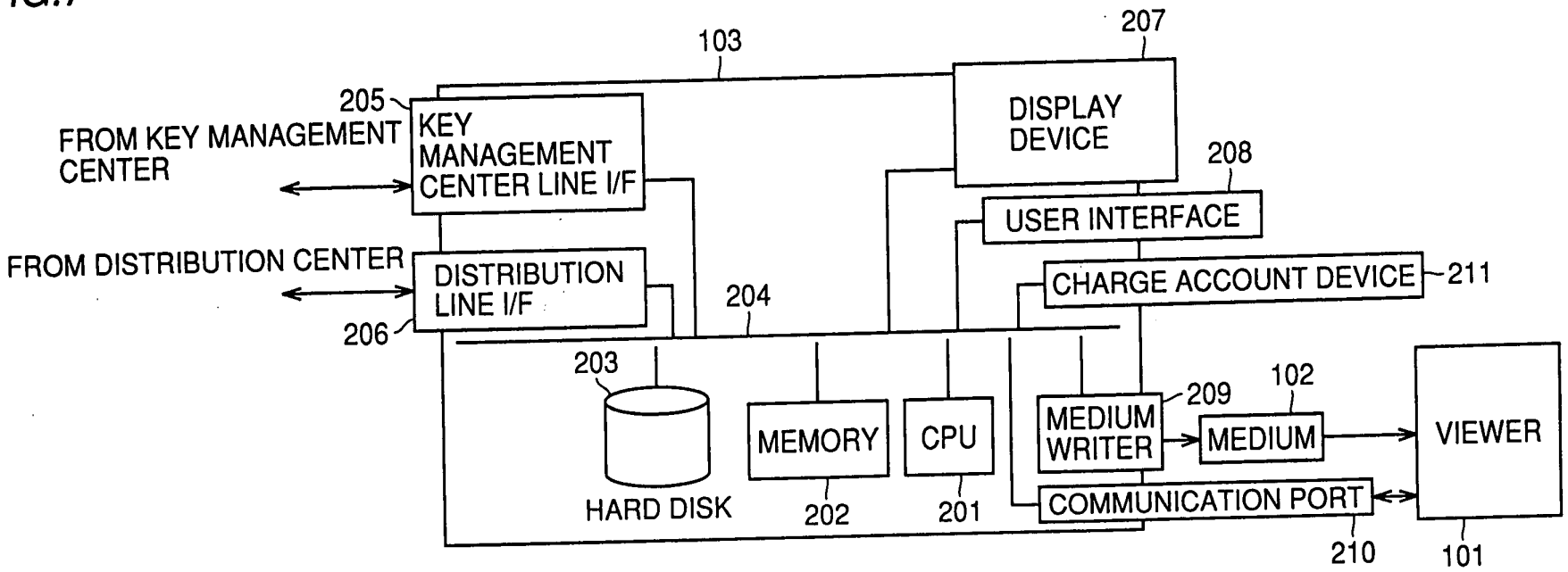

103
207
205
FROM KEY MANAGEMENT CENTER
KEY MANAGEMENT CENTER LINE I/F
DISPLAY DEVICE
208
USER INTERFACE
FROM DISTRIBUTION CENTER
DISTRIBUTION LINE I/F
CHARGE ACCOUNT DEVICE
211
204
206
203
102
209
MEMORY
CPU
MEDIUM WRITER
MEDIUM
VIEWER
HARD DISK
202
201
COMMUNICATION PORT
210
101

FIG.8

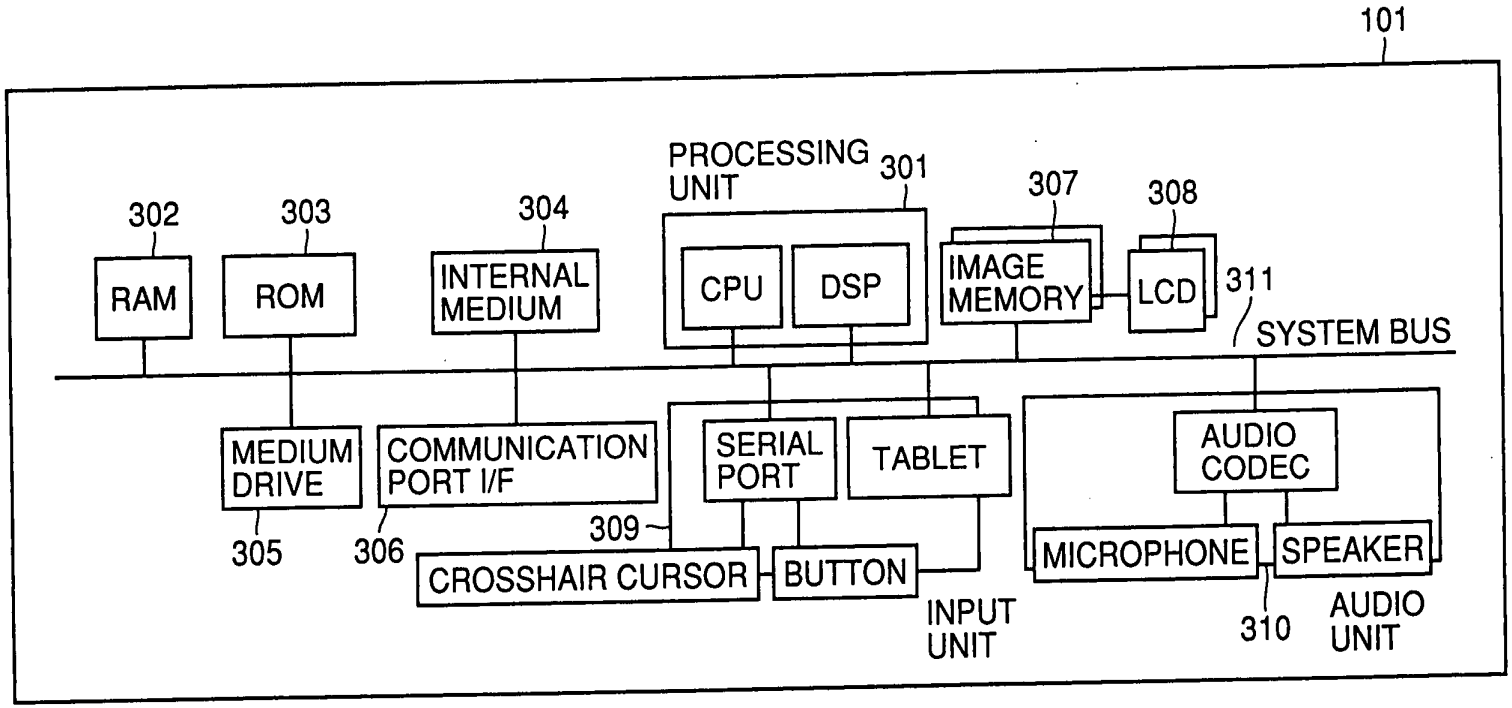

101
PROCESSING UNIT
301
302
303
304
307
308
RAM
ROM
INTERNAL MEDIUM
CPU
DSP
IMAGE MEMORY
LCD
311
SYSTEM BUS
MEDIUM DRIVE
COMMUNICATION PORT I/F
SERIAL PORT
TABLET
AUDIO CODEC
309
305
306
CROSSHAIR CURSOR
BUTTON
MICROPHONE
SPEAKER
INPUT UNIT
310
AUDIO UNIT

FIG.9

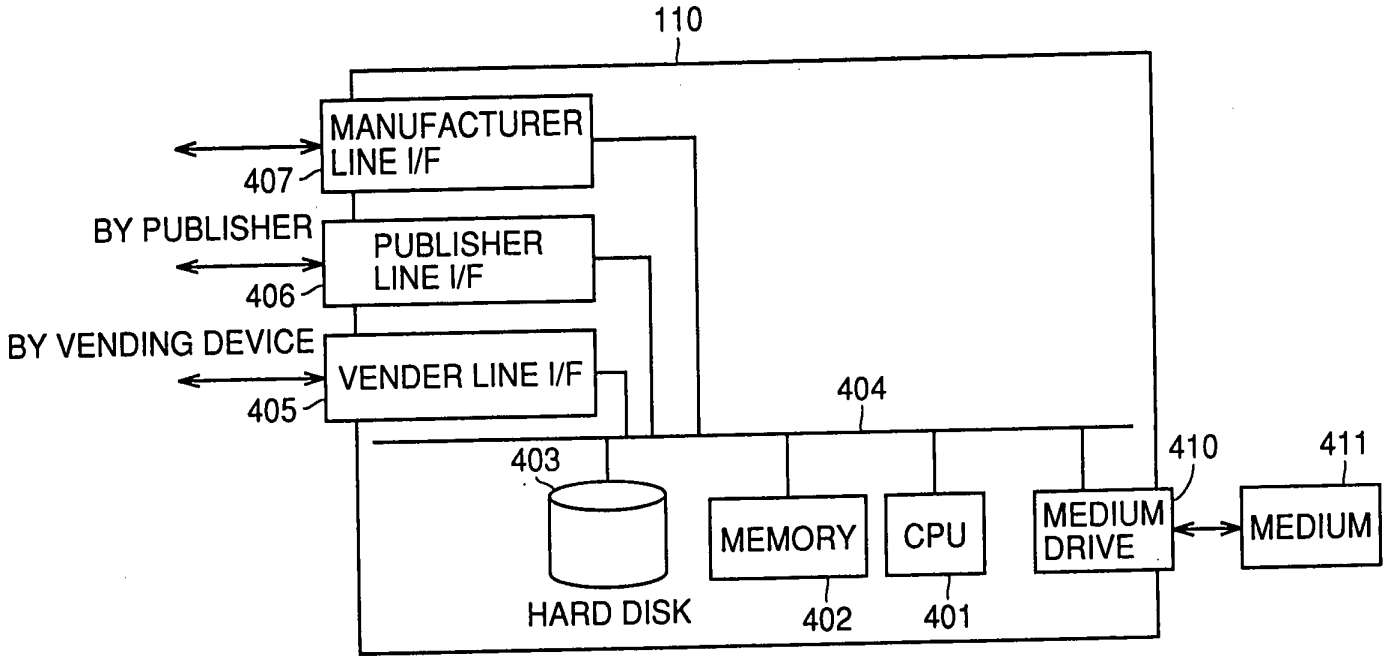

110
MANUFACTURER LINE I/F
407
BY PUBLISHER
PUBLISHER LINE I/F
406
BY VENDING DEVICE
VENDER LINE I/F
405
404
403
410
411
MEMORY
CPU
MEDIUM DRIVE
MEDIUM
HARD DISK
402
401

FIG.10

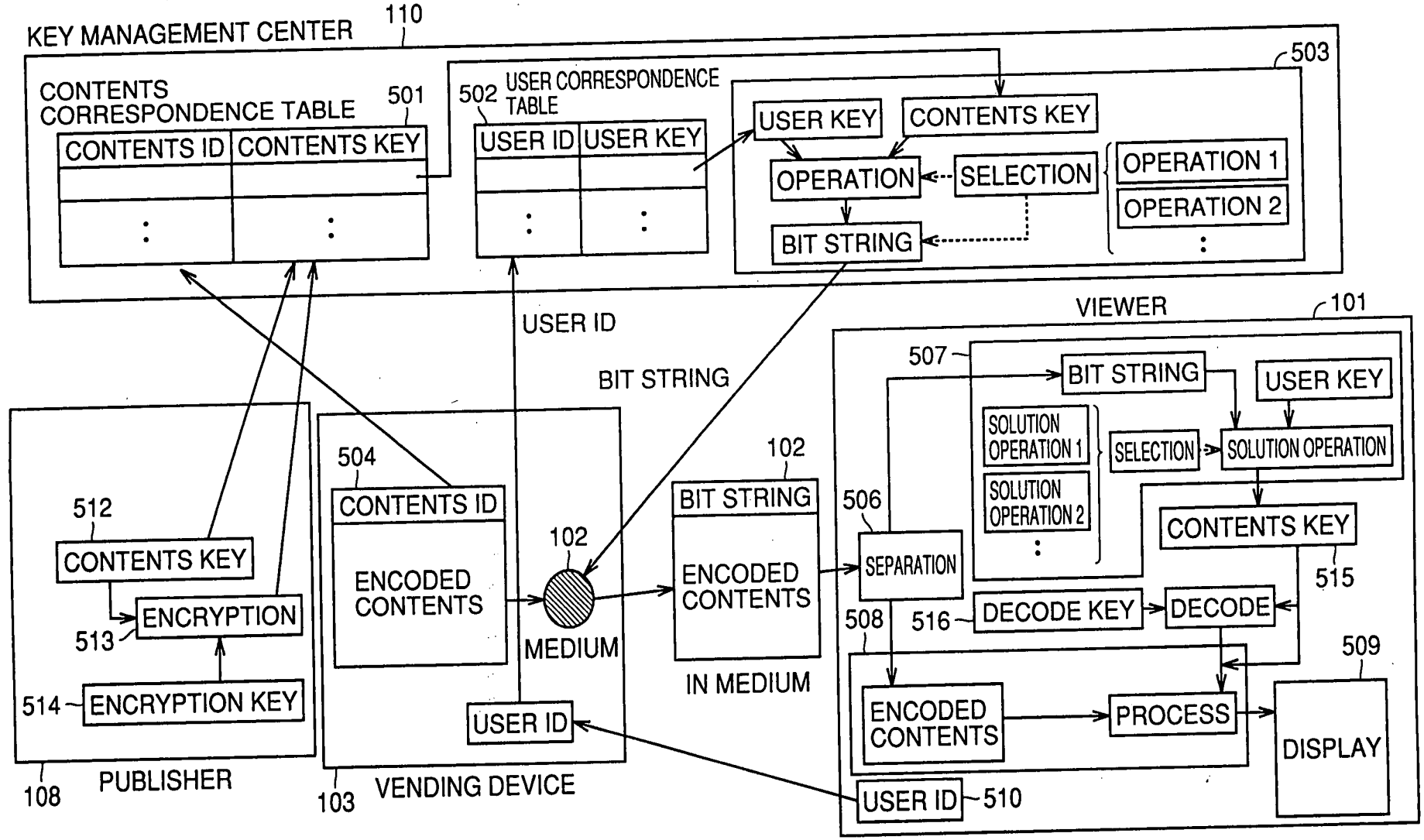

KEY MANAGEMENT CENTER
110
CONTENTS CORRESPONDENCE TABLE
501
CONTENTS ID
CONTENTS KEY
502
USER CORRESPONDENCE TABLE
USER ID
USER KEY
503
USER KEY
CONTENTS KEY
OPERATION
SELECTION
OPERATION 1
OPERATION 2
BIT STRING
USER ID
BIT STRING
VIEWER
101
507
BIT STRING
USER KEY
SOLUTION OPERATION 1
SOLUTION OPERATION 2
SELECTION
SOLUTION OPERATION
CONTENTS KEY
515
506
SEPARATION
DECODE KEY
DECODE
516
508
509
ENCODED CONTENTS
PROCESS
DISPLAY
USER ID
510
512
CONTENTS KEY
ENCRYPTION
513
ENCRYPTION KEY
514
PUBLISHER
108
504
CONTENTS ID
ENCODED CONTENTS
102
MEDIUM
USER ID
VENDING DEVICE
103
102
BIT STRING
ENCODED CONTENTS
IN MEDIUM

FIG.11

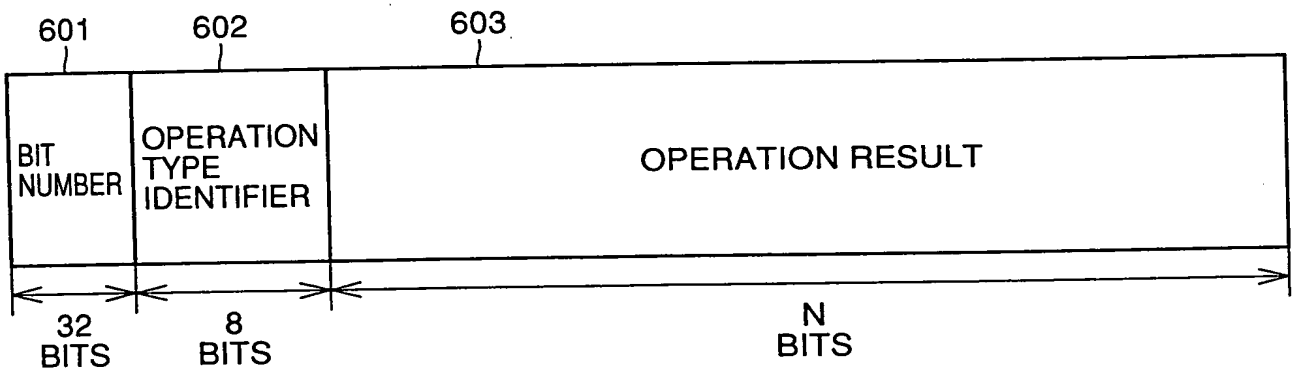

601
602
603
BIT NUMBER
OPERATION TYPE IDENTIFIER
OPERATION RESULT
32 BITS
8 BITS
N BITS

FIG.12

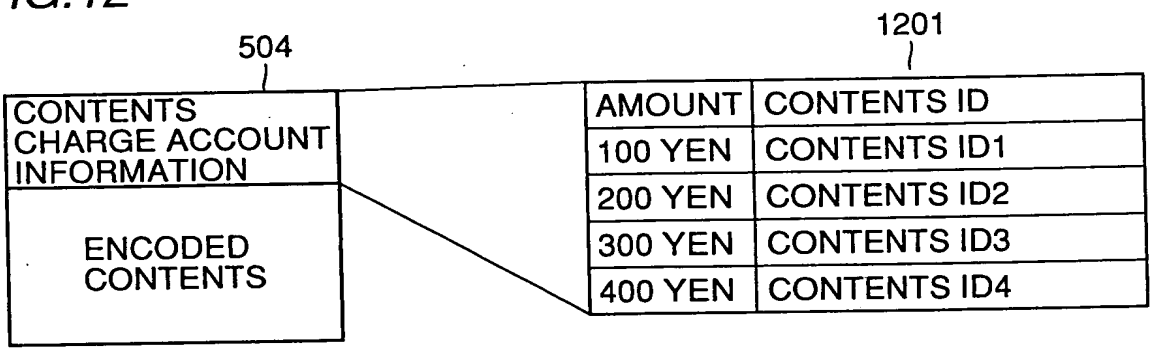

504
1201
CONTENTS CHARGE ACCOUNT INFORMATION
ENCODED CONTENTS
AMOUNT
CONTENTS ID
100 YEN
CONTENTS ID1
200 YEN
CONTENTS ID2
300 YEN
CONTENTS ID3
400 YEN
CONTENTS ID4

FIG.13

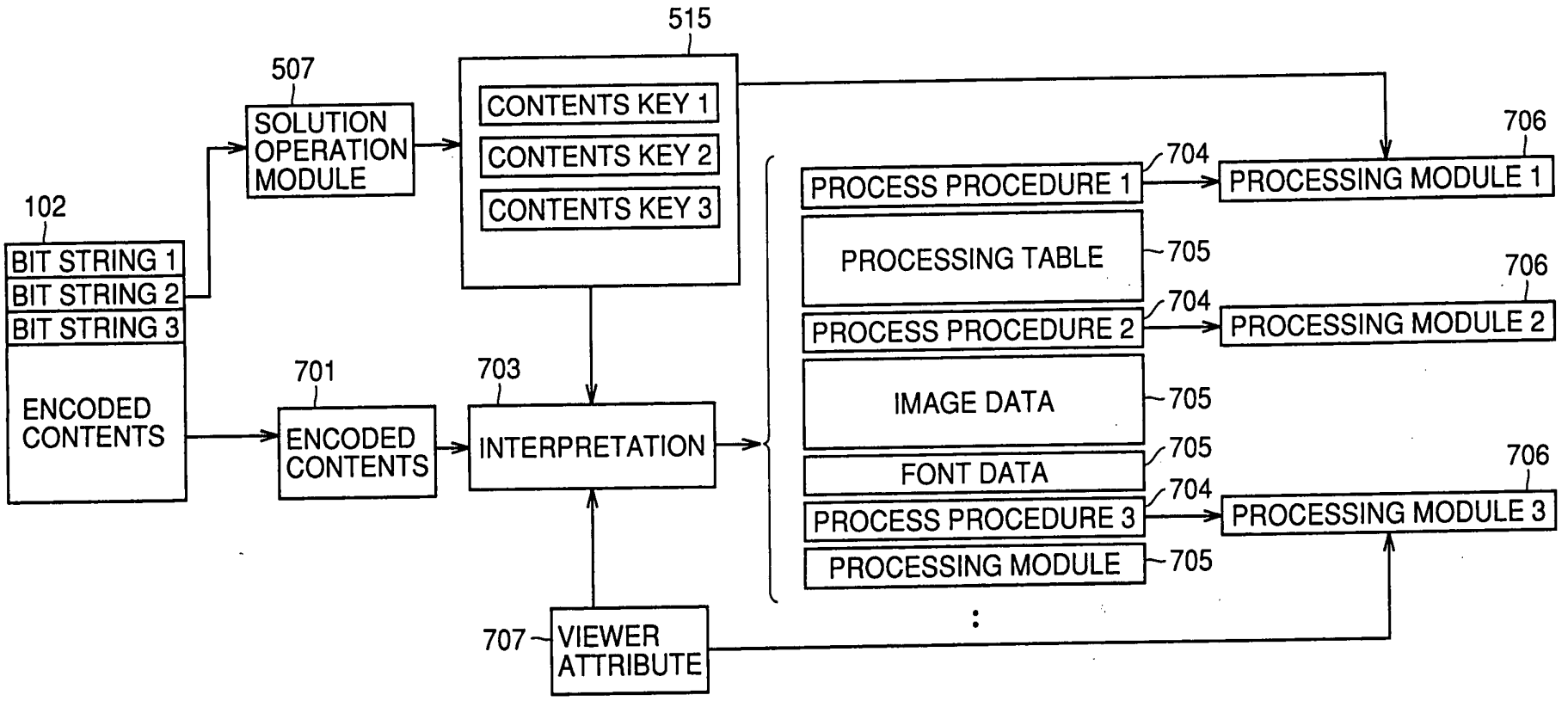
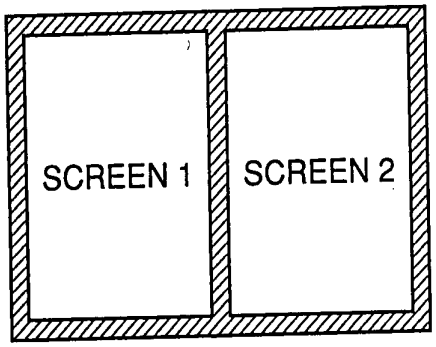

515
507
SOLUTION OPERATION MODULE
CONTENTS KEY 1
CONTENTS KEY 2
CONTENTS KEY 3
706
704
PROCESS PROCEDURE 1
PROCESSING MODULE 1
102
BIT STRING 1
BIT STRING 2
BIT STRING 3
ENCODED CONTENTS
PROCESSING TABLE
705
706
704
PROCESS PROCEDURE 2
PROCESSING MODULE 2
701
703
ENCODED CONTENTS
INTERPRETATION
IMAGE DATA
705
705
FONT DATA
706
704
PROCESS PROCEDURE 3
PROCESSING MODULE 3
PROCESSING MODULE
705
707
VIEWER ATTRIBUTE

FIG.14A



768X1024 PIXELS
MONOCHROME 8 TONES
USE 2 LCD PANELS

FIG.14B

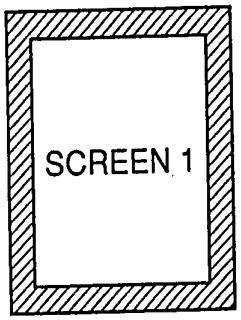
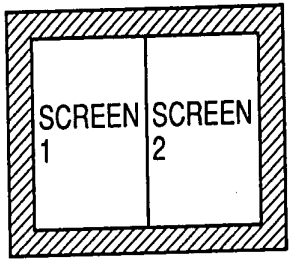
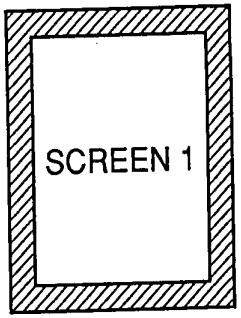


FIG.14C



768X1024 PIXELS
MONOCHROME 8 TONES
USE 1 LCD PANEL

FIG.14D



480X640 PIXELS
260,000 COLORS
USE 1 LCD PANEL

FIG. 15

DISPLAY FORMAT	NUMBER OF LCDs	LCD NUMBER OF PIXELS (XXY)	LCD COLOR	DISPLAYED DIRECTION	NUMBER OF PAGES
(a)	2	768×1024	MONOCHROME 8 TONES	VERTICAL	1
(b)	1	768×1024	MONOCHROME 8 TONES	VERTICAL	1
(c)	1	768×1024	MONOCHROME 8 TONES	HORIZONTAL	2
(d)	1	480×640	260,000 COLORS	VERTICAL	1

FIG. 16

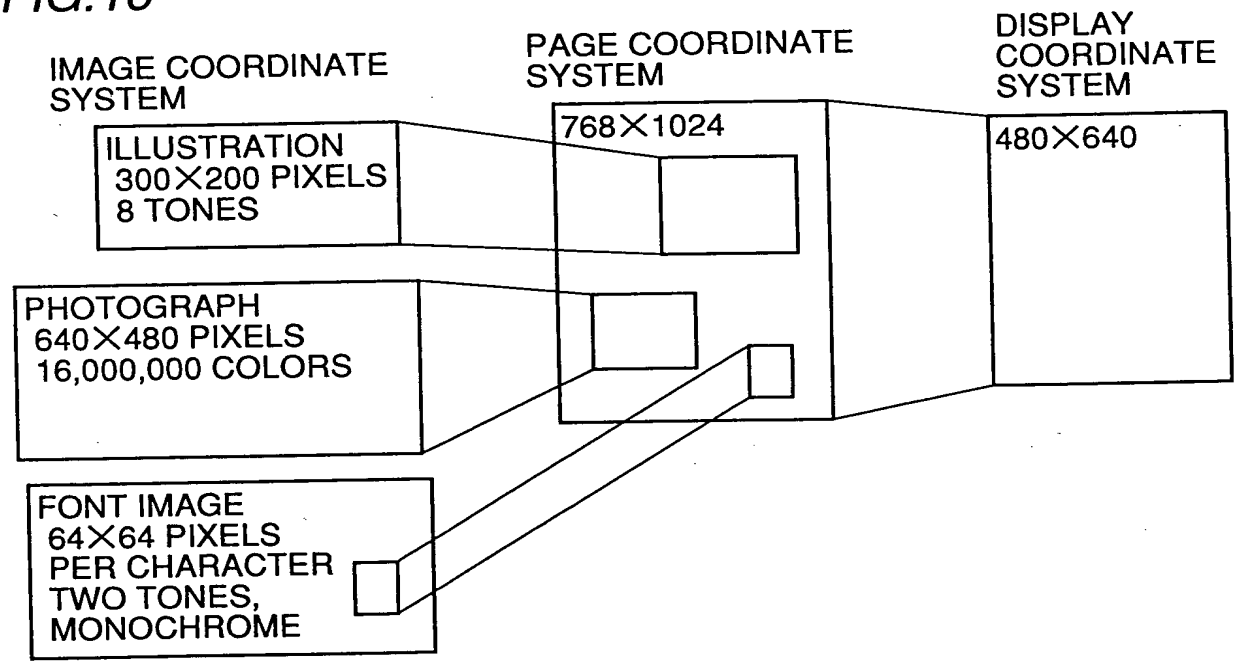


FIG. 17

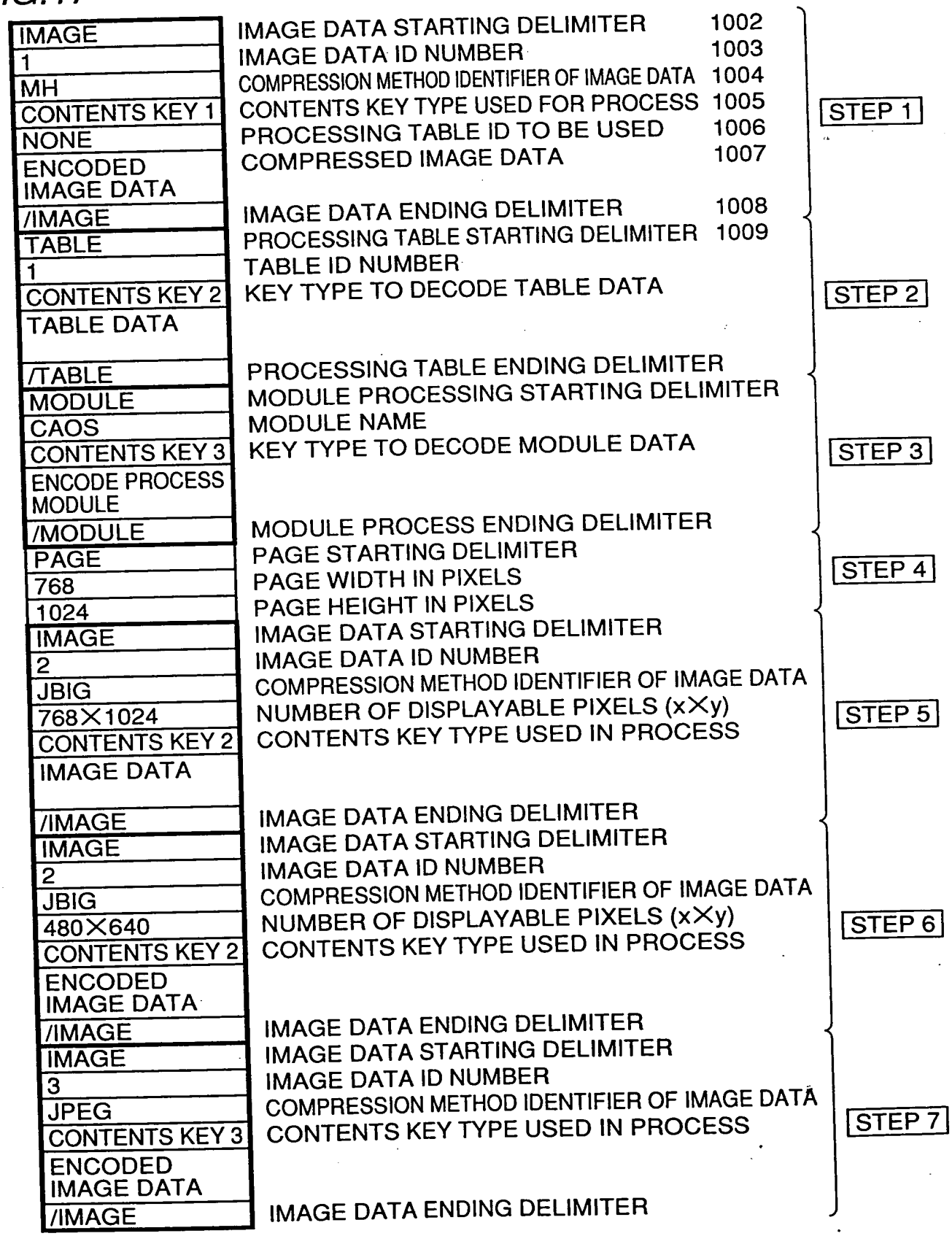


IMAGE
1
MH
CONTENTS KEY 1
NONE
ENCODED IMAGE DATA
/IMAGE
TABLE
1
CONTENTS KEY 2
TABLE DATA
/TABLE
MODULE
CAOS
CONTENTS KEY 3
ENCODE PROCESS MODULE
/MODULE
PAGE
768
1024
IMAGE
2
JBIG
768×1024
CONTENTS KEY 2
IMAGE DATA
/IMAGE
IMAGE
2
JBIG
480×640
CONTENTS KEY 2
ENCODED IMAGE DATA
/IMAGE
IMAGE
3
JPEG
CONTENTS KEY 3
ENCODED IMAGE DATA
/IMAGE
IMAGE DATA STARTING DELIMITER 1002
IMAGE DATA ID NUMBER 1003
COMPRESSION METHOD IDENTIFIER OF IMAGE DATA 1004
CONTENTS KEY TYPE USED FOR PROCESS 1005
PROCESSING TABLE ID TO BE USED 1006
COMPRESSED IMAGE DATA 1007
IMAGE DATA ENDING DELIMITER 1008
PROCESSING TABLE STARTING DELIMITER 1009
TABLE ID NUMBER
KEY TYPE TO DECODE TABLE DATA
PROCESSING TABLE ENDING DELIMITER
MODULE PROCESSING STARTING DELIMITER
MODULE NAME
KEY TYPE TO DECODE MODULE DATA
MODULE PROCESS ENDING DELIMITER
PAGE STARTING DELIMITER
PAGE WIDTH IN PIXELS
PAGE HEIGHT IN PIXELS
IMAGE DATA STARTING DELIMITER
IMAGE DATA ID NUMBER
COMPRESSION METHOD IDENTIFIER OF IMAGE DATA
NUMBER OF DISPLAYABLE PIXELS (x×y)
CONTENTS KEY TYPE USED IN PROCESS
IMAGE DATA ENDING DELIMITER
IMAGE DATA STARTING DELIMITER
IMAGE DATA ID NUMBER
COMPRESSION METHOD IDENTIFIER OF IMAGE DATA
NUMBER OF DISPLAYABLE PIXELS (x×y)
CONTENTS KEY TYPE USED IN PROCESS
IMAGE DATA ENDING DELIMITER
IMAGE DATA STARTING DELIMITER
IMAGE DATA ID NUMBER
COMPRESSION METHOD IDENTIFIER OF IMAGE DATA
CONTENTS KEY TYPE USED IN PROCESS
IMAGE DATA ENDING DELIMITER
STEP 1
STEP 2
STEP 3
STEP 4
STEP 5
STEP 6
STEP 7

FIG.18

PUTIMAGE	IMAGE DRAW PROCESS STARTING DELIMITER
1	IMAGE DATA ID
1	ID NUMBER OF TABLE TO BE USED
1	ID NUMBER OF TABLE INTERNAL PROCESS
CONTENTS KEY 2	
0	SOURCE X COORDINATE Xso
0	SOURCE Y COORDINATE Yso
100	SOURCE RECTANGLE WIDTH IN PIXELS DXs
100	SOURCE RECTANGLE HEIGHT IN PIXELS DYs
120	DESTINATION X COORDINATE Xdo
150	DESTINATION Y COORDINATE Ydo
100	DESTINATION RECTANGLE WIDTH IN PIXELS DXd
100	DESTINATION RECTANGLE HEIGHT IN PIXELS DYd
/PUTIMAGE	IMAGE DRAW PROCESS ENDING DELIMITER
BLUR	IMAGE BLUR PROCESS STARTING DELIMITER
3	IMAGE DATA ID
CONTENTS KEY 4	
3	NUMBER OF SECONDS OF PROCESS START
1	TERM OF PROCESS REPETITION (SECONDS)
10	NUMBER OF REPETITIONS
3	BLUR RECTANGLE SIZE
100	SOURCE X COORDINATE Xso
100	SOURCE Y COORDINATE Yso
64	SOURCE RECTANGLE WIDTH IN PIXELS DX
64	SOURCE RECTANGLE HEIGHT IN PIXELS DY
530	DESTINATION X COORDINATE Xdo
540	DESTINATION Y COORDINATE Ydo
64	DESTINATION RECTANGLE WIDTH IN PIXELS DXd
64	DESTINATION RECTANGLE HEIGHT IN PIXELS DYd
/BLUR	IMAGE BLUR PROCESS ENDING DELIMITER
CAOS	CHAOS PROCESS STARTING DELIMITER
2	ID OF IMAGE DATA TO BE DRAWN
CONTENTS KEY 3	
0	SOURCE X COORDINATE Xso
0	SOURCE Y COORDINATE Yso
100	SOURCE RECTANGLE WIDTH IN PIXELS DX
100	SOURCE RECTANGLE HEIGHT IN PIXELS DY
120	DESTINATION X COORDINATE Xdo
150	DESTINATION Y COORDINATE Ydo
100	DESTINATION RECTANGLE WIDTH IN PIXELS DXd
100	DESTINATION RECTANGLE HEIGHT IN PIXELS DYd
10	NUMBER OF REPETITIONS
0.8	INITIAL VALUE A
3.8	PROCESS PARAMETER P
/CAOS	CHAOS PROCESS ENDING DELIMITER
:	
/PAGE	PAGE ENDING DELIMITER
PAGE	
:	
/PAGE	

STEP 8

STEP 9

STEP 10

FIG.19

PROCESS ID	MAGNIFICATION PROCESS	SHRINK PROCESS	RECUDING NUMBER OF COLORS
1	EDGE ENHANCEMENT AFTER BI-LINEAR INTERPOLATION	SIMPLE SHRINK	BIT SLICE
2	SIMPLE MAGNIFICATION	SIMPLE SHRINK	ERROR DIFFUSION
3	BI-LINEAR INTERPOLATION	BI-LINEAR INTERPOLATION	BIT SLICE

FIG.20

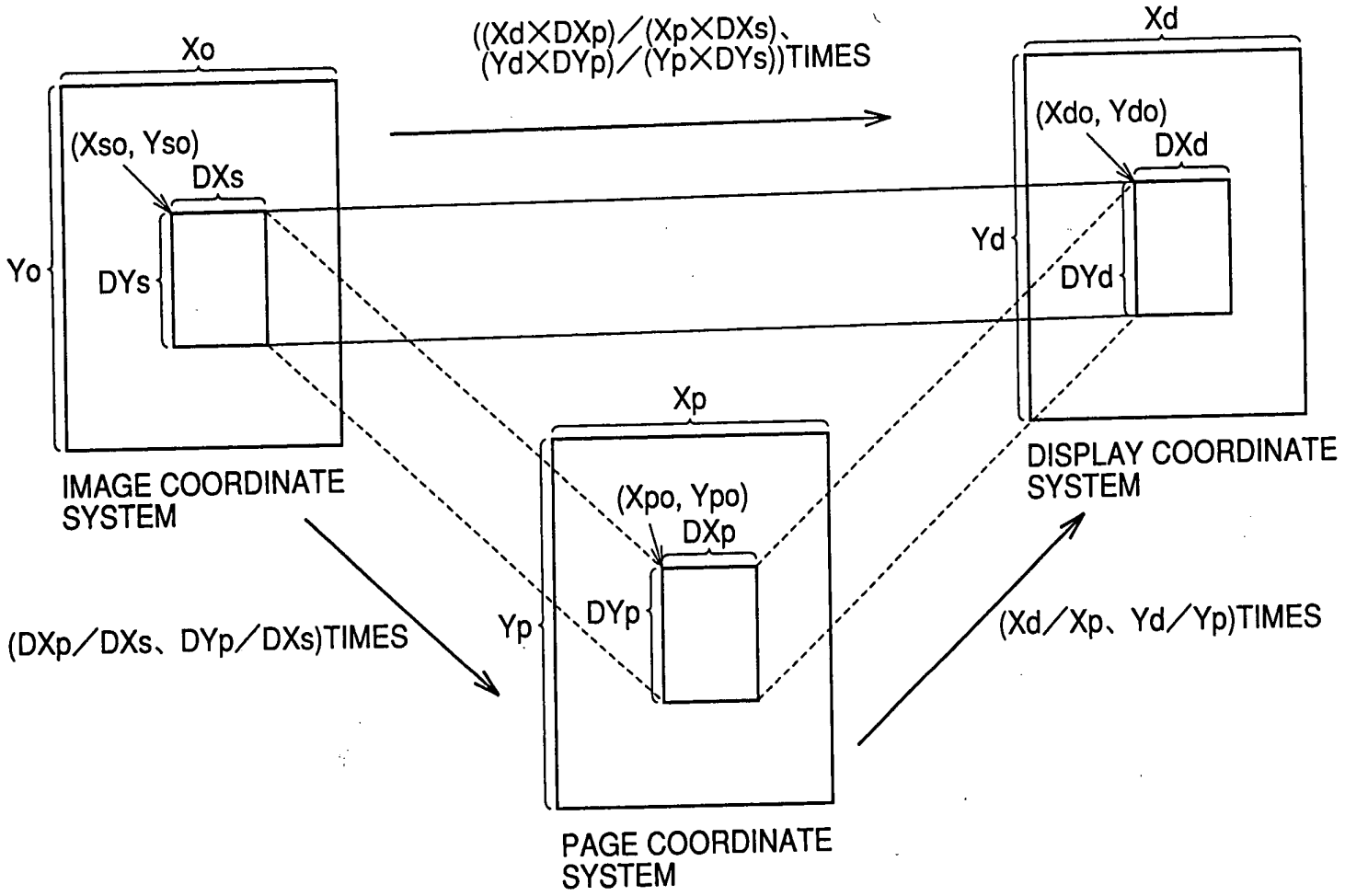

Xo
(Xso, Yso)
DXs
Yo
DYs
IMAGE COORDINATE SYSTEM
((Xd×DXp)／(Xp×DXs)、
(Yd×DYp)／(Yp×DYs))TIMES
Xd
(Xdo, Ydo)
DXd
Yd
DYd
DISPLAY COORDINATE SYSTEM
Xp
(Xpo, Ypo)
DXp
DYp
Yp
PAGE COORDINATE SYSTEM
(DXp／DXs、DYp／DXs)TIMES
(Xd／Xp、Yd／Yp)TIMES

FIG.21

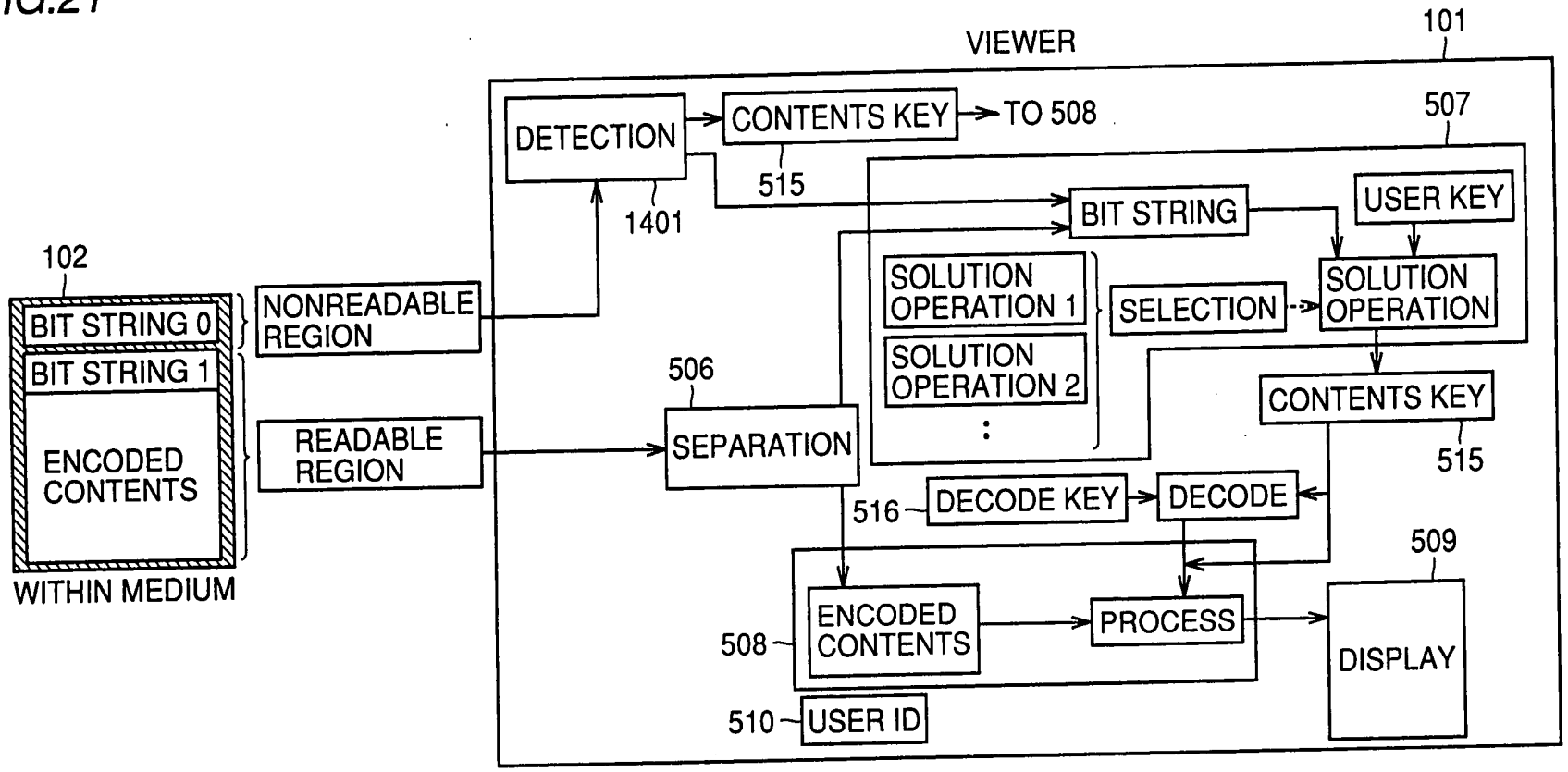

VIEWER
101
DETECTION
CONTENTS KEY
TO 508
507
515
1401
BIT STRING
USER KEY
102
BIT STRING 0
NONREADABLE REGION
SOLUTION OPERATION 1
SELECTION
SOLUTION OPERATION
BIT STRING 1
SOLUTION OPERATION 2
506
CONTENTS KEY
ENCODED CONTENTS
READABLE REGION
SEPARATION
515
516
DECODE KEY
DECODE
509
ENCODED CONTENTS
PROCESS
DISPLAY
508
510
USER ID
WITHIN MEDIUM

FIG.22A

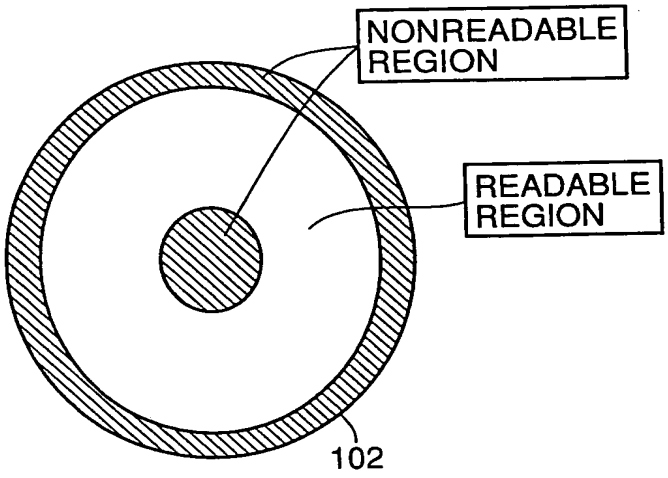


FIG.22B

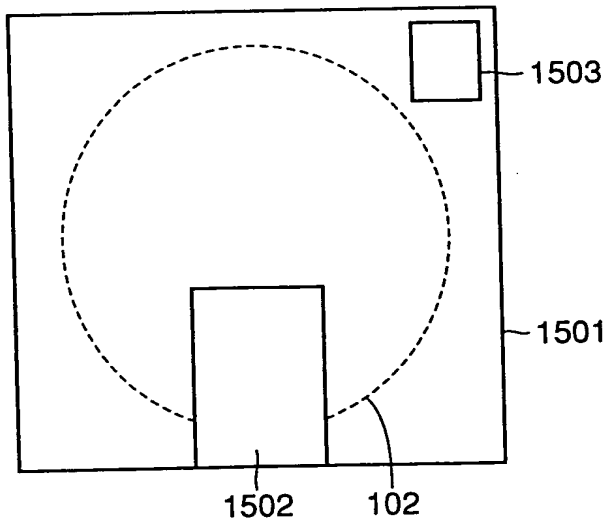


FIG.23

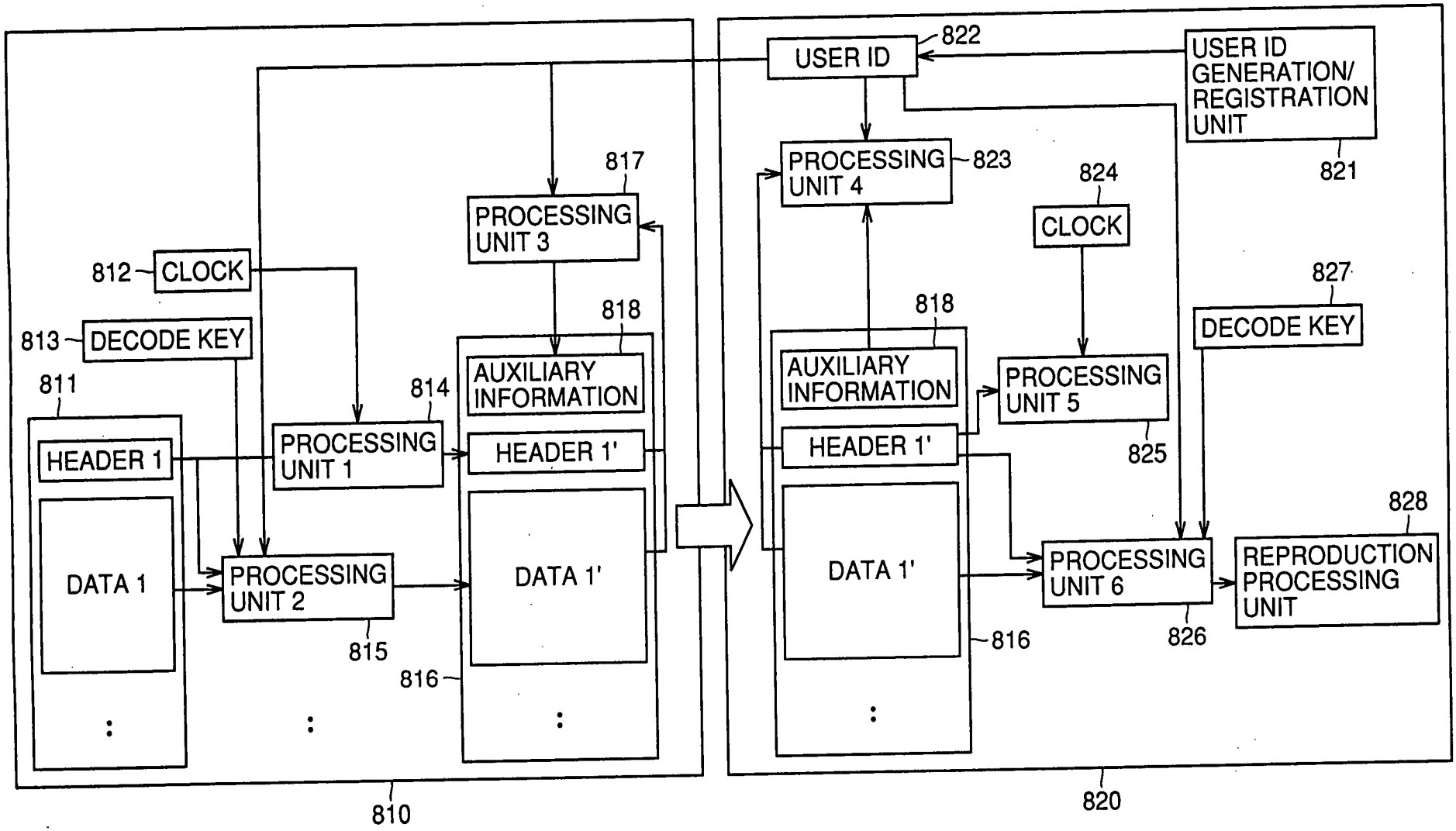
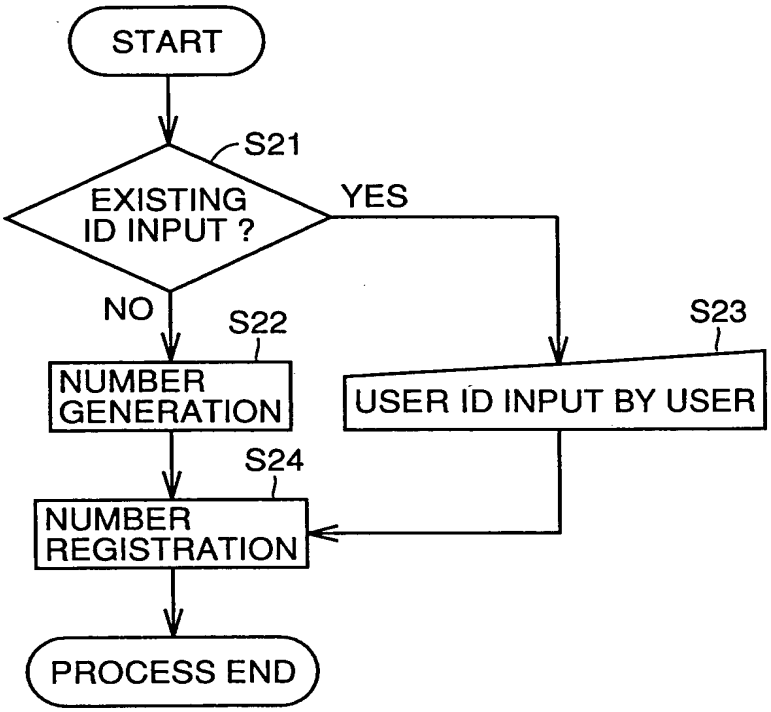

USER ID
822
USER ID GENERATION/ REGISTRATION UNIT
821
PROCESSING UNIT 4
823
824
CLOCK
827
DECODE KEY
817
PROCESSING UNIT 3
812
CLOCK
813
DECODE KEY
818
AUXILIARY INFORMATION
811
814
HEADER 1
PROCESSING UNIT 1
HEADER 1'
PROCESSING UNIT 5
825
828
DATA 1
PROCESSING UNIT 2
DATA 1'
PROCESSING UNIT 6
REPRODUCTION PROCESSING UNIT
815
816
826
810
820

FIG.24


START
S21
EXISTING ID INPUT ?
YES
NO
S22
NUMBER GENERATION
S23
USER ID INPUT BY USER
S24
NUMBER REGISTRATION
PROCESS END